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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/694,586	10/23/2000	Timothy Roy Block	IBM/ 167	8940

7590 02/03/2004

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EXAMINER

BRUCKART, BENJAMIN R

ART UNIT	PAPER NUMBER
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2155

DATE MAILED: 02/03/2004

2

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/694,586

Applicant(s)

BLOCK ET AL.

Examiner

Benjamin R Bruckart

Art Unit

2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Claims 1-31 are pending in this Office Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-31 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 6,108,699 by Moiin.

Regarding claim 1, a method of dynamically modifying a cluster communication parameter in a clustered computer system (Moiin: col. 2, lines 10-20; col. 14, lines 2-15), the method comprising:

(a) initiating a cluster (Moiin: col. 2, lines 16-20), communication parameter modification by transmitting a message to a plurality of nodes in the clustered computer system (Moiin: col. 2, lines 16-20);

(b) locally confirming, within each node, receipt of the message by each of the plurality of nodes (Moiin: col. 2, lines 32-35);

(c) in response to confirming receipt of the message by each of the plurality of nodes, invoking a local cluster communication parameter modification operation on each node (Moiin: col. 2, lines 34-37; col. 14, lines 10-15; transition thread);

(d) transmitting from each node a status of the local cluster communication parameter modification invoked on that node (Moiin: col. 2, lines 44-50);

(e) locally detecting, within each node, an unsuccessful status for the local cluster communication parameter modification on any node (Moiin: col. 2, lines 39-44); and

(f) in response to detecting an unsuccessful status for any node, locally undoing, in each node for which the local cluster communication operation was performed, the local cluster communication parameter modification operation performed on that node (Moiin: col. 2, lines 50-55).

Regarding claim 2, the method of claim 1, wherein the cluster communication parameter comprises a heartbeat parameter (Moiin: col. 14, lines 26-34).

Regarding claim 3, the method of claim 1, wherein the cluster communication parameter is selected from the group consisting of heartbeat message time out, heartbeat acknowledgment message time out, heartbeat frequency or interval, heartbeat failure threshold, heartbeat acknowledgment failure threshold, receive/send timer ratio, maximum fragment size, message retry timer value, maximum message retry time, send queue overflow threshold, message send window size, and combinations thereof (Moiin: col. 13, 60- col. 14, line 34).

Regarding claim 4, the method of claim 1, wherein locally confirming receipt of the message by each of the plurality of nodes includes participating in an ACK round responsive to receipt of the message (Moiin: col. 2, lines 44-50).

Regarding claim 5, the method of claim 1, wherein transmitting from each node a status of the local cluster communication parameter modification invoked on that node is performed during an ACK round performed subsequent to invoking the local cluster communication parameter modification operation (Moiin: col. 2, lines 39-55).

Regarding claim 6, the method of claim 1, wherein transmitting the message, confirming receipt of the message, and transmitting the status are performed via multicast messages (Moiin: col. 2, lines 39-55; multicast is broadcasting to multiple addresses).

Regarding claim 7, an apparatus (Moiin: col. 4, lines 25-32), comprising:

(a) a memory (Moiin: col. 4, line 26); and

(b) a program resident in the memory (Moiin: col. 4, lines 15-18), the program configured to dynamically modify a cluster communication parameter on a local node among a plurality of nodes in a clustered computer system (Moiin: col. 2, lines 16-20; col. 14, lines 2-15), the program configured to locally confirm, for the local node, successful receipt of an initiation message by each of the plurality of nodes (Moiin: col. 2, lines 32-35), and a status for a local cluster communication parameter modification operation performed by each of the plurality of nodes (Moiin: col. 2, lines 44-50), the program further configured to undo a local cluster communication parameter modification operation performed on the local node in response to detection of an unsuccessful status for a local cluster communication parameter modification on any node (Moiin: col. 2, lines 50-55).

Regarding claim 8, the apparatus of claim 7, wherein the program is further configured to locally confirm receipt of an initiating message by each of the plurality of nodes (Moiin: col. 2, lines 44-50; col. 2, 32-34; Figure 4, tag 406).

Regarding claim 9, the apparatus of claim 8, wherein the program is configured to locally confirm receipt of the initiating message by each of the plurality of nodes by participating in an ACK round responsive to receipt of the message (Moiin: col. 2, lines 44-50; Figure 4, tag 406).

Regarding claim 10, the apparatus of claim 7, wherein the program is further configured to transmit from the local node a status of the local cluster communication parameter modification operation (Moiin: col. 2, lines 39-55; status of success or failure dependent on response).

Regarding claim 11, the apparatus of claim 10, wherein the program is configured to transmit the status during an ACK round performed subsequent to invocation of the local cluster communication parameter modification operation (Moiin: col. 2, lines 32-34, lines 44-50).

Regarding claim 12, a clustered computer system (Moiin: col. 2, lines 10-16), comprising:

(a) a plurality of nodes coupled to one another over a network (Moiin: col. 3, lines 64-col. 4, line 1; Figure 1); and

(b) a plurality of programs (Moiin: col. 4, lines 15-18), each local to a node among the plurality of nodes (Moiin: col. 4, lines 13-18), each program configured to dynamically modify a cluster communication parameter on its respective local node (Moiin: col. 2, lines 16-20; col. 14, lines 2-15), each program further configured to locally confirm, for its respective local node, successful receipt of an initiation message by each of the plurality of nodes (Moiin: col. 2, lines 32-35), and a status for a local cluster communication parameter modification operation performed by each of the plurality of nodes (Moiin: col. 2, lines 44-50), and each program further configured to undo a local cluster communication parameter modification operation performed on its respective local node in response to detection of an unsuccessful status for a local cluster communication parameter modification on any node (Moiin: col. 2, lines 50-55).

Regarding claim 13, a program product (Moiin: col. 4, lines 25-32), comprising:

(a) a program configured to dynamically modify a cluster communication parameter on a local node among a plurality of nodes in a clustered computer system (Moiin: col. 2, lines 16-20; col. 14, lines 2-15), the program configured to locally confirm, for the local node, successful receipt of an initiation message by each of the plurality of nodes (Moiin: col. 2, lines 32-35), and a status for a local cluster communication parameter modification operation performed by each of the plurality of nodes (Moiin: col. 2, lines 44-50), the program further configured to undo a local cluster communication parameter modification operation performed on the local node in response to detection of an unsuccessful status for a local cluster communication parameter modification on any node (Moiin: col. 2, lines 50-55); and

(b) a signal bearing medium bearing the program (Moiin: col. 4, lines 58-66).

Regarding claim 14, the program product of claim 13, wherein the signal bearing medium includes at least one of a transmission medium and a recordable medium (Moiin: col. 5, lines 9-17; col. 4, lines 28-32).

Regarding claim 15, the program product of claim 13, wherein the program is further configured to locally confirm receipt of an initiating message by each of the plurality of nodes (Moiin: col. 2, lines 32-35).

Regarding claim 16, the program product of claim 15, wherein the program is configured to locally confirm receipt of the initiating message by each of the plurality of nodes by participating in an ACK round responsive to receipt of the message (Moiin: col. 2, lines 32-35, lines 44-50; Figure 4, tag 406).

Regarding claim 17, the program product of claim 13, wherein the program is further configured to transmit from the local node a status of the local cluster communication parameter modification operation (Moiin: col. 2, lines 39-55).

Regarding claim 18, the program product of claim 17, wherein the program is configured to transmit the status during an ACK round performed subsequent to invocation of the local cluster communication parameter modification operation (Moiin: col. 2, lines 32-35, lines 39-55).

Regarding claim 19, a method of dynamically modifying a heartbeat parameter in a node among a plurality of nodes in a clustered computer system (Moiin: col. 2, lines 16-20; col. 14, lines 2-15, lines 26-34), the plurality of nodes including first and second nodes (Moiin: Figure 1), the first node configured to send a heartbeat message to the second node (Moiin: col. 2, lines 16-20), and the second node configured to send an acknowledgment message to the first node in response to receiving the heartbeat message (Moiin: col. 2, lines 29-34), the method comprising:

(a) sending a heartbeat message from the first node to the second node, the heartbeat message indicating that a heartbeat parameter is to be modified (Moiin: col. 14, lines 26-34, lines 10-15); and

(b) deferring modification of the heartbeat parameter in the first node until receipt of an acknowledgment message sent from the second node to the first node that indicates that the

heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 34-44, lines 50-55; col. 7, lines 31-61).

Regarding claim 20, the method of claim 19, further comprising determining whether modifying the heartbeat parameter on the first node requires synchronization with the second node (Moiin: col. 14, lines 10-15, lines 26-34, Figures 4, 5, and 6; col. 2, lines 29-37).

Regarding claim 21, the method of claim 20, wherein determining whether modifying the heartbeat parameter on the first node requires synchronization with the second node further comprises determining whether the heartbeat parameter is local or global in nature (Moiin: col. 14, lines 19-21; col. 5, lines 18-30).

Regarding claim 22, the method of claim 19, further comprising, in response to receiving the heartbeat message with the second node, sending an acknowledgment message from the second node to the first node, the acknowledgment message indicating whether the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 32-34, lines 44-55; col. 7, lines 53-61).

Regarding claim 23, the method of claim 22, wherein each of sending the heartbeat message and sending the heartbeat acknowledgment message includes accessing a heartbeat message record that includes a change request indicator (Moiin: col. 6, lines 35-42; cluster size field change sets the flag to Figure 4 events), the method further comprising:

(a) prior to sending the heartbeat message that indicates that the heartbeat parameter is to be modified, setting the change request indicator in the heartbeat message record (Moiin: col. 6, lines 13-19, lines 35-52; col. 7, lines 31-40, 53-61), and

(b) prior to sending the heartbeat acknowledgment message that indicates whether the heartbeat parameter has been modified in the second node, selectively setting or clearing the change request indicator in the heartbeat message record (Moiin: col. 6, lines 13-19, lines 35-52; col. 7, lines 31-40, 53-61).

Regarding claim 24, the method of claim 23, wherein deferring modification of the heartbeat parameter in the first node until the acknowledgment message indicates that the heartbeat parameter has been modified in the second node includes modifying the heartbeat parameter in the first node only after receiving a heartbeat acknowledgment message with a set change request indicator (Moiin: col. 7, lines 31-61).

Regarding claim 25, the method of claim 19, further comprising:

(a) modifying the heartbeat parameter in the second node (Moiin: col. 2, lines 32-38; col. 14, lines 10-15); and

(b) modifying the heartbeat parameter in the first node after receipt of an acknowledgment message sent from the second node to the first node that indicates that the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 44-54; col. 14, lines 10-15).

Regarding claim 26, an apparatus (Moiin: col. 4, lines 25-32), comprising:

(a) a memory (Moiin: col. 4, line 26); and

(b) a program resident in the memory (Moiin: col. 4, lines 15-18) and configured to dynamically modify a heartbeat parameter in a first node among a plurality of nodes in a clustered computer system by sending a heartbeat message to a second node among the plurality of nodes that indicates that the heartbeat parameter is to be modified (Moiin: col. 2, lines 16-20; col. 14, lines 2-15) and thereafter deferring modification of the heartbeat parameter in the first node only after receiving an acknowledgment message from the second node indicating that the heartbeat parameter has been modified in the second node (Moiin: col. 2, lines 44-54; col. 14, lines 10-15).

Regarding claim 27, the apparatus of claim 26, wherein the program is further configured to determine whether modifying the heartbeat parameter on the first node requires synchronization with the second node (Moiin: col. 14, lines 10-15, lines 26-34, Figures 4, 5, and 6).

Regarding claim 28, the apparatus of claim 27, wherein the program is configured to determine whether modifying the heartbeat parameter on the first node requires synchronization with the second node by determining whether the heartbeat parameter is local or global in nature (Moiin: col. 14, lines 19-21; col. 5, lines 18-30).

Regarding claim 29, the apparatus of claim 26, wherein the program is configured to send the heartbeat message by accessing a heartbeat message record that includes a change request indicator (Moiin: col. 6, lines 35-42), and wherein the program is further configured to set the change request indicator in the heartbeat message record prior to sending the heartbeat message that indicates that the heartbeat parameter is to be modified (Moiin: col. 6, lines 13-19; col. 7, lines 31-40, 53-61).

Regarding claim 30, the apparatus of claim 29, wherein the program is configured to defer modification of the heartbeat parameter in the first node until the acknowledgment message indicates that the heartbeat parameter has been modified in the second node by modifying the heartbeat parameter in the first node only after receiving a heartbeat acknowledgment message with a set change request indicator (Moiin: col. 6, lines 13-19; col. 7, lines 31-40, 53-61).

Regarding claim 31, a program product (Moiin: col. 4, lines 25-32), comprising:

- (a) a program configured to dynamically modify a heartbeat parameter in a first node among a plurality of nodes in a clustered computer system by sending a heartbeat message to a second node among the plurality of nodes that indicates that the heartbeat parameter is to be modified (Moiin: col. 2, lines 16-20; col. 14, lines 2-15) and thereafter deferring modification of the heartbeat parameter in the first node only after receiving an acknowledgment message from the second node indicating that the heartbeat parameter has been modified in the second node (Moiin: col. 6, lines 13-19; col. 7, lines 31-40, 53-61); and
- (b) a signal bearing medium bearing the program (Moiin: col. 4, lines 58-66).

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U. S. Patent No. 6,047,323 issued to Krause.

U. S. Patent No. 6,192,417 issued to Block et al.

U. S. Patent No. 6,292,905 issued to Wallach et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin R Bruckart whose telephone number is (703) 305-0324. The examiner can normally be reached on 8:00-5:30 PM with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (703) 308-6662. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0324.

Benjamin R Bruckart
Examiner
Art Unit 2155
brb
January 29, 2004

BRB

Hosain Alam

**HOSAIN ALAM
SUPERVISORY PATENT EXAMINER**